

Preface

Over the next decade, power plant operators may face significant requirements to reduce emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) beyond the levels called for in the Clean Air Act Amendments of 1999. They could also face requirements to reduce carbon dioxide (CO₂) and mercury (Hg) emissions. Several proposed bills in Congress have targeted reductions of these four emissions. At present, neither the future reduction requirement nor the complete timetable is known for any of these airborne emissions, and compliance planning is difficult.

Recently, plans have been proposed that would require simultaneous reductions of multiple emissions. This analysis responds to a request from Senators Bob Smith, George Voinovich, and Sam Brownback to examine the costs of specific multi-emission reduction strategies (see Appendix A for the requesting letter). In their request Senators Smith, Voinovich, and Brownback asked the Energy Information Administration (EIA) to analyze the impacts of three scenarios with alternative power sector emission caps on NO_x, SO₂ and Hg. They also requested an analysis of the potential impacts of requiring power suppliers to acquire offsets for any increase in CO₂ emissions that occur beyond the level expected in 2008.

The projections and quantitative analysis for this report were prepared using the National Energy Modeling System (NEMS), an energy-economy model of U.S. energy markets designed, developed, and maintained by EIA, which is used each year to provide projections for EIA's *Annual Energy Outlook* and for other analyses and service reports. Using econometric, heuristic, and linear programming techniques, NEMS consists of 13 modules that represent the demand (residential, commercial, industrial, and transportation sectors), supply (coal, renewables, oil, and natural gas supply and transmission and distribution), and conversion (refinery and electricity sectors) of energy, together with a macroeconomic module that links energy prices to economic activity, with a representation of international oil markets.

The report is organized as follows. Chapter 1 provides a brief introduction together with a description of the analysis cases and methodology. Chapter 2 provides electricity and fuel market results. Detailed results are provided in the appendixes.

Using its Independent Expert Review Program, EIA arranged for leading experts in the fields of energy and

economic analysis to review this analysis and provide comment. All comments from the reviewers either have been incorporated or were thoroughly considered for incorporation. As is always the case when peer reviews are undertaken, not all the reviewers may be in agreement with all the methodology, inputs, and conclusions of the final report. The contents of the report are solely the responsibility of EIA. The assistance of the following reviewers is gratefully acknowledged:

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The projections in the reference case in this report are not statements of what will happen but of what might happen, given the assumptions and methodologies used. The reference case projections are business-as-usual trend forecasts, given known technology, technological and demographic trends, and current laws and regulations. Thus, they provide a policy-neutral reference case that can be used to analyze policy initiatives. EIA does not propose, advocate, or speculate on future legislative and regulatory changes. All laws are assumed to remain as currently enacted; however, the impacts of emerging regulatory changes, when defined, are reflected.